Space Weather Forecast

Issued on Tuesday 3 December 2024 at 00:56 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only Common-class flares observed. There are eight sunspot region on the visible disc, the largest of which are a pair of regions in the southwest. However these are magnetically relatively simple and have been largely inactive. The next most notable is the larger of the regions in the southeast. This is a small east-west aligned sunspot, but also a relatively simple and currently inactive bipolar group. The other regions remain relatively stable and inactive.

A couple of filament eruptions (arcs of plasma) off the southwest quadrant, near the vicinity of the two large sunspot regions, are currently being analysed for any potential Earth-directed components. No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds speeds, were background to slightly elevated, ranging between 330km/s, rising to reach 490km/s, after the CME arrival from Nov 27. The Interplanetary Magnetic Field (IMF) strength, Bt, was moderate throughout. The north-south component (Bz) was mostly positive (northward) throughout, until the arrival of the glancing CME, re-orientating to negative (southward) by the end of the period. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: A slow Coronal Mass Ejection (CME) from a filament eruption (arc of plasma) on 27 Nov arrived at Earth late on 02 Dec, however only limited enhancements are expected into day 1 (03 Dec). With currently no further enhancements from any CME arrivals or Coronal Holes, the solar wind speeds are expected to be slightly elevated to background throughout the period. Geomagnetic activity is expected to be mainly Quiet with isolated Unsettled intervals throughout. Any CME enhancement on Day 1 (03 Dec) brings a slight chance of an Active spell.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at background, with only a slight chance of these increasing if any larger solar flares were to occur.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	40	50	50	50
Very Active	R3-R5 (X Class)	No	5	5	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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